March 15, 1948.

Dr. Frank H. Stodola,
Fermentation Division,
Northern Regional Research Laboratory,
Peoria Illinois.

Dear Frank,

Thanks very much for having sent those samples so promptly. It turns out that wild type strains of coli, fully active on lactose, maltose and gluconic acid, are inactive on either maltobionic or lactobionic acid. This seems to make at least this conjecture as to the route of utilization unprofitable. Of course, it is entirely possible that phosphorylated derivatives are involved, but since glucose-1-phosphate is not utilized appreciably by intact cells, the study begins to involve techniques that, for the moment, are beyond my routine facilities.

I've done only a preliminary experiment on the keto-gluconate. It is utilized so slowly that, as such, it is not a likely intermediate in gluconic metabolism.

I'm sorry that I haven't yet reached a degree of rapport with the Chemistry Dept. that I dare ask them for a service help like the Ca,C,H analyses on your Ca Xylonate sample. It isn't that they haven't been entirely cooperative, but I don't think the time is quite ripe yet for that kind of thing. I'll broach the subject as soon as that seems feasible.

The mutant (W-108) which was mentioned in my last letter ~~latter~~ has turned out to be a gold mine. Among other things, a second mutation (at another locus) has been selected out of it which is glucose-,maltose-. If not an artefact of some sort it suggests that coli definitelyhhas some sort of direct fermentative mechanism. Tests for the accumulation of glucose are being set up, right now.

I can't possibly hope to make (or have made here) all of the substrates which might be promising in the differentiation of different mutants, so I engaged in the somewhat unrespectable occupation of shopping around for some of them. B-methyl galactoside turned out to be very useful, since some Lac- will, others will not, utilize it. I should be delighted to get hold of even small (0.5 g) samples of other compounds related to lactose—B galactosides,-uronides, lactositol, a-l-arabinosides, to determine which of them give sufficiently distinctive results to be worth trying to prepare on a larger scale. Any material or suggestions you could give me in this direction would be very helpful. Which reminds me that I haven't heard yet from Dr. Montgomery, but did not inquire earlier as I had heard somewhere that she had been ill. If she has recovered, please remind her of my request for 10 mg. of iso-maltose.

K.P. Link has just had word that Helferich is still alive and active, but has had no other communication with him.

Yours sincerely,

Joshua Lederberg